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IN REPLY REFER TO

DAAG-PAP-A (M) (5 Dec 72) DAFD-OTT

22 December 1972

SUBJECT: Senior Officer Debriefing Report: Major General Robert N. Mackinnon, Commander, 1st Aviation Brigade and USARV Aviation Officer, July 1971 - July 1972 (U)

SEE DISTRIBUTION

1. Reference: AR 525-14, Senior Officer Debriefing Report (U), 2 July 1971.
2. Transmitted herewith is the report of Major General Robert N. Mackinnon, subject as above.
3. This report is provided to insure appropriate benefits are realized from the experiences of the author. The report should be reviewed in accordance with paragraphs 3 and 5, AR 525-14; however, it should not be interpreted as the official view of the Department of the Army, or of any agency of the Department of the Army.
4. Information of actions initiated under provisions of AR 525-14, as a result of subject report should be provided to the Assistant Chief of Staff for Force Development, ATTN: DAFD-OTT within 90 days of receipt of covering letter.

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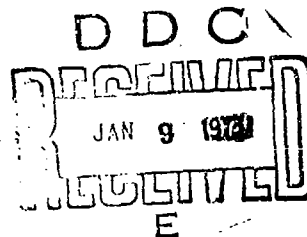
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Verne L. Bowers
VERNE L. BOWERS
Major General, USA
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DEBRIEFING REPORT

SUBJECT: Senior Officer Debriefing Report (MG Robert N. Mackinnon), RCS
CSFOR-74

THRU: Deputy Commanding General
USARV/MACV Support Command
APO San Francisco 96222

TO: Assistant Chief of Staff for Force Development
ATTN: FOR OT UT
Department of the Army
Washington, DC 20310

Debriefing Report by: Major General Robert N. Mackinnon

Duty Assignment: Commanding General, 1st Aviation Brigade and USARV
Aviation Officer

Inclusive Dates: July 1971 to July 1972

Date of Report: 1 July 1972

1. (U) Introduction: The past year has been one of marked change in the nature and intensity of the war in Vietnam. Significant events have been the continued phased reduction of USARV Aviation assets in conjunction with the drawdown of US Military Forces, the low level of friendly and enemy activity from 1 July 1971 until 30 March 1972, the invasion of South Vietnam by the NVA, and lastly the introduction of sophisticated weaponry and its subsequent effects on USARV Aviation assets. The invasion has again proven the efficacy of the airmobility concept and the ability of the helicopter and its crew to survive in a dense and sophisticated air defense environment.

2. (C) Aviation Force Structure:

a. From a peak of over 3200 rotary and fixed wing aircraft assigned to the USARV fleet in July 1971, there remained only 984 at the end of Increment XII on 1 July 1972. The aviation unit of two divisions, an #2214340

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Armored Cavalry Regiment, the Engineer Command and all Artillery aviation assets together with 128 units of the 1st Aviation Brigade were inactivated or redeployed during Increments VIII thru XII. The 1st Aviation Brigade alone was reduced by over 19,000 personnel spaces.

b. MACV provided the initial guidance concerning force ceilings and the associated time frames. This enabled plans to be developed to reduce USARV Aviation resources to a level commensurate with the support requirements generated by US and Free World Military Armed Forces and the VNAF Improvement and Modernization Program. The effectiveness of this previous planning was degraded to a considerable degree by the lack of firm and timely guidance both before and after the start of each increment. MACV's unawareness of troop ceilings until established by Presidential announcement, the short duration of each increment, and the incompatibility that existed between operational and logistical requirements during retrograde operations combined to militate against an orderly reduction of aviation forces.

3. (C) Reduction in Force of the 1st Aviation Brigade by Increments:

a. Increment VIII occurred from July thru August 1971. A total of 4 companies and 3 detachments with a total of 1054 personnel spaces and 155 aircraft stood down during this increment. There were no problems as this increment was well planned, executed, and was of sufficient duration to accomplish the mission in an orderly manner.

b. Increment IX occurred from September thru November 1971. This increment was accomplished with no undue hardship on the 1st Aviation Brigade. Personnel turbulence resulting from Keystone criteria was minimal. The assigned strength closely paralleled authorizations although there was a shortage throughout the Brigade in certain critical aviation skills. A total of one group, one battalion, and 11 companies were redeployed or inactivated for a total reduction of 2837 personnel spaces and 363 aircraft.

c. Increment X began a period of excessive personnel turbulence because it was conducted concurrently with a Christmas early release policy. It was in this increment that USARV established curtailments across the board with no consideration for skills needed to maintain operational effectiveness. During this increment the number of standardization pilots, test pilots, and LOH pilots became critical and personnel with these skills had to be exempted from curtailment and transferred to other units. Morale problems occurred since many personnel missed curtailment by as little as one day, and others were declared mission essential and could not be curtailed. This increment occurred from December 1971 thru January 1972. During this period one group, three battalions, 14 companies and 12 detachments stood down for a total reduction of 4501 personnel spaces and 279 aircraft.

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d. Increment XI lasted from February thru April 1972 and caused extreme turbulence and critical shortages of certain aviation and aviation related maintenance skills. As in Increment X, USARV established an Army-wide curtailment that allowed everyone with a DEROS before a specific date to be curtailed. It became necessary for the 1st Aviation Brigade to ask for an exception to this policy in order to retain certain mission essential MOS's. In order to preclude a deluge of Inspector General complaints and congressional inquiries as to why non-aviation skill MOS's were curtailed and aviation related skills were not, commanders were directed to personally explain to all personnel the need for this necessary action. Many of the problems associated with reaching the required strength level during Increment XI were caused by the unreliability of the personnel data base. This problem will be discussed later in this report. A total of 13 battalions, 37 companies, and 28 detachments were redeployed or inactivated for a total reduction of 10,603 personnel spaces and 422 aircraft.

e. Increment XII which occurred from May thru June 1972 had little effect on the 1st Aviation Brigade. During Increment XII, two detachments were redeployed for a total reduction of 147 personnel spaces, while two companies were added for a total gain of 385 personnel spaces and 56 aircraft. The net gain was 138 personnel spaces and 56 aircraft.

4. (S) Projects and actions that occurred during Increments VIII - XII:

a. Project 981 was the project code assigned for the accelerated transfer of major end items to VNAF under the IQM Program. This project tasked USARV to transfer 284 UH-1H helicopters, 22 CH-47 helicopters and 101 O-1G airplanes. These aircraft were transferred from excess USARV requirements and Keystone drawdowns. Transfer criteria established were for UH-1H's in the 500 - 1500 hour grouping which were transferred to VNAF in like-new condition. All CH-47's transferred were 1966 "A" models. No special criteria was established for the O-1G transfer. Aircraft were provided to establish four additional UH-1H squadrons, one additional CH-47A squadron and advanced attrition aircraft to VNAF for FY 72 and FY 73. Actual transfer of aircraft was initiated in Nov 71 and inputs were staggered monthly to meet VNAF's needs. All requirements on Project 981 were met on a timely basis, and the project was completed by 30 June 1972. In addition to the aircraft, 92 XM-23 gun systems, and four sets of Ground Support Equipment for CH-47A's were transferred to the new squadrons. Problem areas encountered during this accelerated program stemmed from several factors. First, communications between this headquarters and VNAF had to pass through the Air Force Advisory Group, which created a lag that slowed the transfer process. Direct coordination would have and did alleviate this problem. The last problem area was VNAF's lack of urgency in accepting RFI aircraft. Many aircraft were held as long as 30 days after being ready for issue, placing an additional burden on the DSU to provide revetment space and maintenance on these aircraft. Had VNAF arranged for a staging area, this would have alleviated this problem.

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b. Project 982 was the transfer of aircraft repair parts, which provided a 365 day requisitioning objective based on aircraft already owned by VNAF and projected for transfer from USARV. A ceiling level of 13.7 million dollars was established and this program was completed on 30 June 1972.

c. Project Enhance. This project is a separate entity from Project 981 and provides additional aircraft for transfer to the VNAF. This project tasks USARV to bring VNAF's total helicopter fleet up to 628 UH-1H's, and 37 CH-47A's as of 30 June 1972. An additional 32 UH-1H helicopters with XM-23 armament subsystems plus 44 additional XM-23 armament subsystems are to be transferred as of 31 July 1972 to increase VNAF's 16 UH-1H squadrons from 31 to 33 helicopters each. These aircraft will be obtained from RVN in-country assets, and will be in the 500 - 2500 hour grouping. All aircraft requirements for this project have been identified by USARV, and processing of aircraft has been initiated. All lessons learned during project 981 were incorporated into Enhance. VNAF will provide a technical inspector and test pilot at every processing DSU on a full time basis to accept aircraft. Once aircraft have been accepted they will be ferried to a VNAF staging area for storage.

d. Retrograde of Aircraft. The total inventory reduction since July 1971 has been over 2200 aircraft. Although retrograde has been a continuing program since the beginning of incremental standdowns, the greatest bulk of the retrograde has occurred during the past six months. Since the first of the calendar year, over 1200 aircraft have been retrograded, and an additional 300 aircraft have been transferred to VNAF or destroyed. Surface retrograde of aircraft was restricted to two types of vessels. OH-6 and OH-58 aircraft were shipped by Sealand Van with two aircraft in each van. All other aircraft were transported by Seatrain vessels. Military Sealift Command Far East provided dedicated Seatrain service for aircraft retrograde in January. During the ensuing three months five Seatrains were utilized to 100% of their capacity which averaged approximately 130 aircraft per Seatrain. All un-serviceable aircraft were retrograded by air. Monthly totals for retrograde during the last six months were: Jan 184, Feb 434, Mar 404, Apr 76, May 114 and Jun 17. The following problem areas were experienced during the peak retrograde period:

(1) A firm list of standdown units could not be provided at the beginning of the increment, consequently accurate predictions of retrograde aircraft by type and timeframe was very difficult. This was further complicated by the many changes of standdown dates and units throughout the increment.

(2) Although the Transportation Movement Agency provided all the assistance possible to obtain Seatrains at the proper time, it was incumbent upon the direct support units to meet the Seatrain timetable rather than vice versa. Consequently, it was difficult to regulate the

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aircraft scheduled into ports so as to avoid presenting too lucrative a target for mortar or rocket attacks, and still to provide sufficient retrograde aircraft on the other hand. This was particularly difficult when two Seatrans arrived in-country within a few days of each other.

(3) Disposal of the O-1G and U-6A aircraft through MIMEX and Property Disposal Office channels caused a storage problem because aircraft had to be retained for periods in excess of 60 days before shipment could be made.

e. VNAF Improvement and Modernization Program (IGM). The IGM project was originated to convert the VNAF helicopter squadrons from CH-34 to UH-1 aircraft. Phase I was completed in September 1969 when four squadrons were converted to UH-1's. Phase II was completed in July 1971 and added eight UH-1 squadrons and one CH-47 squadron to the VNAF structure. Phase III started on 1 November 1971 and involved the conversion of one CH-34 squadron to UH-1H aircraft and the activation of three UH-1H squadrons and one CH-47 squadron. USARV has helped ease the burden of transition by VNAF pilots into the newer aircraft by providing 180 hours of operational flying with US units for all UH-1H pilots and 110 hours for all CH-47 pilots. These pilots lived and worked with the assigned US units for three months while they were acquiring the necessary flight time. Additionally, 164 VNAF enlisted CH-47 maintenance personnel were given two weeks of formal schooling and four weeks of OJT with USARV CH-47 units. To further ease the burden of activation or conversion, a USARV augmentation team of operations and maintenance advisors and instructor pilots was furnished for 90 days to assist VNAF units. The success of this program has been demonstrated by their combat flying hours and operational achievements. Although they compare favorably with US units on flight hours and operational achievements, the VNAF has sustained a slightly higher combat loss and damage rate. The two greatest problems at present are low maintenance availability and uneven leadership. Both are a direct result of the lack of experienced personnel and should be resolved in time.

f. Third Country Aviation Related Training. In December 1971, USARV received 51 Free World Military Force personnel for training as crewmembers for UH-1M gunships. A mobile training assistance team was provided from Fort Rucker. In March 1972, 60 Khmer Air Force enlisted personnel received two weeks of UH-1 maintenance and doorgunner training taught by Cambodian interpreters under supervision of French speaking US instructors. Other smaller groups have received similar training in flight and maintenance skills. The continued reduction of USARV assets precludes further third country training unless resources are made available from outside RVN.

g. Aviation Training and Standardization. USARV ceased its operation of the two aviation training and standardization schools during Increment XI. The aviation training school produced 174 instructor pilots and standardization instructor pilots for the OH-6, AH-1G, UH-1 and OH-58 aircraft. The Army Aviation Refresher Training School

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provided refresher training in aviation maintenance for some 300 officers and enlisted men. Both schools were extremely valuable and were an important adjunct to the training received in CONUS. The current program for USARV flight standardization provides for centralized control, but decentralized execution. A USARV flight standardization section has been established to supervise, monitor, inspect, and assist the standardization activities of units throughout RVN.

h. Aviation Safety. USARV has actively pursued a dynamic and effective program to prevent aircraft accidents. The two primary reasons for the reduction in the aircraft accident rate in FY 72 have been the concerted efforts of commanders and crewmembers to minimize situations that result in aircraft accidents, and the assignment of graduates of the USC Army Aviation Safety Course down to company level as safety officers. The accident rate for FY 72 for USARV was 17.1 per 100,000 flying hours and 13.7 for the 1st Aviation Brigade. When compared to FY 71 figures of 19.0 for USARV and 16.4 for 1st Aviation Brigade this represents a 15.3% overall reduction in aircraft accidents.

i. Reduction of Control Headquarters. The staff of the 1st Aviation Brigade and the USARV Aviation Officer were integrated on 1 December 1971. Integration of the command functions of the 1st Aviation Brigade and the staff/advisory function of the USARV Aviation Office has worked exceptionally well and resulted in a savings of 57 personnel spaces. During Increment XI all thirteen of the remaining battalion headquarters were inactivated. At the last part of Increment XI, MACV directed retention of three aviation companies scheduled for standdown. The increased enemy activity, the geographical distance, and increased span of control necessitated the establishment of one provisional battalion headquarters in MR 2.

5. (U) Problems that occurred during Increment VIII thru XII.

a. Transfer of personnel records to a PSC. During Increment XI, a major factor that adversely affected the 1st Aviation Brigade strength was the requirement to convert the maintenance of personnel records from a unit personnel office (UPO) to a personnel service company (PSC). This transfer of records was planned to be implemented over a lengthy time frame to allow for a smooth transition; however, in some units it was accomplished in a number of days. All personnel with a DEROS before 30 April were to have their records maintained by the unit personnel office and records of those personnel with DEROS after 30 April were to be maintained by the PSC. Many last minute changes in the curtailment criteria created much turmoil between the PSC and UPO and had an adverse effect on Brigade morale. As it stands now, it will take some time to make the PSC concept responsive to the commander since most of the authorization documents of the Brigade are still in a state of flux.

b. Storage of critical enlisted skills caused by inaccuracies of the USARV Data Base. All enlisted personnel below the grade of E-7 in

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USARV are requisitioned by computers using the USARV data base. Errors in the data base have compounded the critical skill imbalances discussed in the increments above. The errors occurred over an extended period and primarily came from unit morning reports. High turn over in company clerks, first sergeants and company commanders have enabled errors to be carried over from previous incumbents. Lack of trained clerks and supervisors has resulted in additional errors. To overcome the problem of updating and correcting the USARV data base, the 1st Aviation Brigade has held command musters. At these musters a number of checks and balances between morning reports, MGS inventories, and personnel rosters were conducted. As a result of these musters, conferences with the DCSPA, USARV, and subsequent messages between DCSPA and the Enlisted Personnel Directorate, Department of the Army, individual replacements with the required skills have begun to arrive in USARV.

6. (C) Aviation Combat Activities.

a. 15 July 1971 to 30 March 1972. The combat activity during the period 15 July 1971 to 30 March 1972 was characterized primarily by small unit engagements, small unit airmobile operations, and the absence of sustained combat operations. The only noteworthy exception occurred during August thru September 1971 when the 12th Combat Aviation Group supported III Corps in Operation Toan Thang with three combat aviation battalions and an air cavalry squadron. The assault helicopter companies supported by an aerial weapons company and an assault support helicopter company conducted intensive combat assault operations with each of the ARVN divisions against four VC/NVA divisions. These combat airmobile operations were employed to reinforce ARVN fire support bases, reinforce ground contact, and to maneuver ground troops into offensive positions. Four air cavalry troops teamed with the aerial weapons company to screen the AO and target large enemy forces for destruction by tactical air power. In October and November 1971, the 12th Combat Aviation Group supported the Airborne Division's sweep into the CHUP Rubber Plantation Dan Be area in Cambodia. Other noteworthy airmobile operations during this period include the 17th CAG's support of the ROK Capital Division in September 1971 in the vicinity of Qui Nhon and the 164th CAG's support of the IV Corps operation in the U-Minh Forest in August 1971.

b. 31 March 1972 to 30 June 1972. The combat activity of Army aviation units since the NVA invasion which began on 31 March 1972 has been extensive in Military Regions 1 and 2 and at a somewhat lower level in Military Regions 3 and 4.

(1) MR-1 - On 31 March 1972, the NVA offensive was opened with a push from the DMZ to a line just north of Hue. The 11th CAG responded to the NVA offensive by increasing airmobile support to the most heavily engaged ARVN units, providing emergency resupply and gun ship support, and conducting emergency extraction of US advisors. Aerial surveillance by OV-10's assigned to the 11th CAG was expanded to cover all MR's and

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the Steel Tiger area of Laos and North Vietnam. In early April, a cavalry troop from MR 3 was deployed to MR 1 to provide visual reconnaissance and screening missions against the NVA forces. This troop is presently in direct support of the Vietnamese Marine Corps (VNMCC) Division and Airborne Division in an area north of Hue. This area contains a very high AAA threat and numerous enemy armored vehicles. Another cavalry troop was placed OPCON from 196th Light Infantry Brigade on 13 May and has been conducting screening and reconnaissance missions to the west of Hue. On 19 May an anti-tank platoon of 6 UH-1M helicopters armed with the SS-11 missiles was assigned to the 11th CAG to provide them an aerial anti-tank capability. Both Air Cavalry units have teamed with US, VNAF and USMC helicopter units to conduct visual reconnaissance, to precede the lift and to mark the landing zones for behind the lines airmobile assaults and raids. The key to these successful operations has been thorough planning, detailed coordination, and aggressive execution.

(2) MR-2 - The first phase of the enemy attacks in MR 2 was directed against a line of firebases 20 km northwest of Kontum City. The offense was typified by intense artillery attacks followed by repeated ground assaults. The 17th CAG units flew gunship, lift, and visual reconnaissance missions in active support of the ARVN Divisions defending these bases. On 24 April enemy tank and infantry attacks forced the evacuation of these bases and preparations for the defense of Kontum began. Determined enemy armor and infantry assaults on the Kontum defensive line began on 14 May. On 26 May the enemy made an all out effort to capture Kontum. Of particular note was the fact that on this date two TOW equipped UH-1B aircraft destroyed nine (9) enemy tanks. The firepower, logistical support, reconnaissance efforts, and command and control provided by the Army Aviation assets of the 17th CAG helped blunt the NVA offensive in the Central Highlands and were one of the deciding factors in the successful defense of Kontum City.

(3) MR-3 - On 30 March, an NVA force of six infantry regiments supported by an anti-aircraft artillery regiment and tank battalion attacked and overran Loc Ninh and laid siege to An Loc. Although their only cavalry troop was OPCON to MR 1, 12th CAG played a vital role in the defense of An Loc. Artillery and critical supplies were moved by CH-47's and emergency evacuations and resupply missions were performed by single UH-1H helicopters. On two occasions 12th CAG planned, coordinated, and successfully led VNAF airmobile assaults into An Loc. The bulk of Army Aviation support during the battle of An Loc was provided by aviation elements assigned to the 3rd Brigade, 1st Cavalry Division and will not be covered here.

(4) MR-4 - To date large scale enemy actions have not been conducted in the Delta; however, small guerrilla unit encounters have increased. The 164th CAG has continued with its support of ARVN Divisions in the Delta and provided airlift support to relocate the 21st ARVN Division from MR 4 to MR 3.

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c. Tactics: Because of the increased anti aircraft threat in all military regions detailed planning for the use of aviation assets became mandatory. Extensive planning between ground units, lift elements to include reconnaissance units, and fire support organizations was determined again to be the key to success for operations in the conventional anti-aircraft environment. The density and the sophistication of the enemy ground-to-air weapons in some areas required that all aviation units be thoroughly proficient in nap-of-the-earth techniques.

7. (U) Introduction and effectiveness of U.S. Weapons to Counter the Enemy Threat.

a. TOW XM-26.

(1) In reply to a request by USARV, CDEC team #4 with two UH-1B helicopters equipped with the XM-26 TOW missile system arrived in-country on 24 April. The team and equipment were assembled and deployed to Pleiku on 29 April. The XM-26 system proved to be highly effective and was a valuable addition to the combat resources in MR 2. From the time of deployment until 22 June, the TOW aircraft fired 110 rounds in combat and training. These firings destroyed eight abandoned M-41 tanks, two 105mm howitzers, one 3/4 ton truck, and seven 2 1/2 ton trucks. All of this equipment was captured by the enemy, being used or usable at the time of destruction. Additionally, twelve T-54 tanks, six PT-76 tanks, one bridge, one POL dump, one ammo dump, a 122mm rocket launching bunker, one 23mm anti-aircraft gun, a ZIL 6x6 truck, four AAICV M1962 APC's, three bunkers, and two machine gun positions were destroyed by the XM-26 system. The most noteworthy success occurred on 26 May during the battle for Kontum City when nine tanks, one truck, and two machine gun positions were destroyed by the TOW aircraft. Of the 21 misses, 14 were the result of crew error.

(2) The XM-26 system was deployed in a package consisting of one TOW UH-1B, one C&C helicopter and two escort AH-1G's. The package responded to requests from the II Corps C&C helicopter (Air Boss) or II Corps TOC. The priority of targets was armored vehicles, artillery pieces, and wheeled vehicles. Reports of enemy targets were submitted by Air Force FAC's, Air Cavalry units, ground units, and other sources to the controlling agencies for immediate launch, confirmation, and firing clearance. Pending notification of a target the TOW aircraft were on strip alert. Prior to entry into the target area the TOW aircraft were joined by the remainder of the package. The C&C aircraft controlled the package, coordinated with the area C&C aircraft for fire clearance, supervised the employment, and was available for recovery of the crew members and classified components if necessary.

(3) Weather and enemy situation permitting, the TOW aircraft flew at 2000 to 3000 feet AGL and engaged the target at a slant range of 3000 meters. Although TOW missiles have been fired just as effectively at low level during training missions, the stand off range and altitude

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used was considered the best means of employment in MR 2 due to the heavy small arms and .51 cal threat and the lack of significant enemy missile threat. The TOW helicopters received fire up to and including 51 caliber on approximately one quarter of their firing runs.

(4) Two major problems have been encountered during night firings with the TOW missile. The first was that the illumination from the infrared source in the base of the missile obscured the target in the gunner's sight as the missile was launched. This illumination has been reduced significantly by the use of an infrared spectral filter attached to the sight. The second problem is inadequate illumination of the target during engagement. Experience has determined that three Mark-48 flares between 500 ft and 1,000 ft AGL provide the best illumination for target engagement. Flare illumination over the target is the key to night firing and requires the utmost in coordination and team work between the flare ship and the TOW gunner. Indications have been that under ideal conditions reasonable success is possible at night; however, a significantly more advanced night capability should be developed.

b. SS-11, XM-22 Missile System.

(1) On 7 May a platoon of six UH-1C helicopters armed with XM-22 systems arrived from CONUS to increase the aerial anti-tank capability. The UH-1C's were converted to UH-1M's in-country and were deployed to DaNang on 19 May.

(2) In the two anti-tank engagements to date, targets were acquired by the Air Cavalry units using a package similar to that used with the TOW aircraft. The package of 2 LOH's, 2 cobras, and a C&C aircraft provide the vectors and escort until the mission is complete. Since 8 June the UH-1M's have flown as an additional gun ship with "Cav Packs" of the Air Cavalry units in MR 1 in order to reduce reaction time. To counter the Strella missile threat, the SS-11 aircraft have engaged their targets from an altitude of 25 ft to 50 ft AGL at a slant range of 1,500 - 3,000 meters. As of 20 June, 175 missiles have been fired in training and 34 missiles fired against enemy targets. The results of this combat action have been one T-54 destroyed, one T-54 damaged, one PT-63 destroyed, one PT-63 damaged, four bunkers destroyed, and one building destroyed with secondary explosions.

(3) The major problem encountered with this system is the coordination to engage a target. The missile must be continuously guided by control inputs from the gunner so that it strikes the target. While this system is effective against hard targets and has provided an additional anti-tank capability in MR 1, it has neither the accuracy nor the potential of the TOW system.

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c. 2.75" FFAR with Mark-5 Dual Purpose Warhead (SM-247).

(1) With the introduction of enemy armor into the theater, a need was established to have an effective armor defeating capability. A similar problem was encountered by AH-1G aircraft in determining what ratio of anti-armor to anti-personnel ordnance was to be carried. The dual purpose warhead eliminated both problems in that it could be employed against both hard and soft targets.

(2) The XM-247 was available only in limited quantities and combat experience and other data was limited. It has been used sparingly against troops in the open, bunkers, lightly armored vehicles and on two occasions against tanks. Against the PT-76/63 the XM-247 proved effective; however, in the one recorded engagement against a T-54 the XM-247 did not destroy the tanks although several direct hits were observed. Excellent results have been achieved against all other type targets. When employed through rubber tree canopies, there appears to be a better sub-canopy effect than the standard HE round. Used in An Loc against masonry buildings with tile or tin roofs, the XM-247 appeared to direct more of the explosive force inside the building thus blowing out the walls. One report indicated the effective use of the XM-247 to destroy an APC and then engage the survivors as they fled the vehicle.

(3) Initial reports have indicated that using units are well pleased with the target destruction and ballistic characteristics of this round. While it is too early to appraise its effectiveness against heavy armor, it appears that the advantages of this round outweigh any apparent disadvantages and that it can be employed with satisfactory results against a wide range of targets.

d. OV-1D Mohawk Surveillance.

(1) Basic airframe improvements of the "D" model include bigger engines, stronger fuselage and wing, an integrated on-board ECM package, a greatly improved navigation system, and sensors which are readily interchangeable at unit level.

(2) AN/APS-94D (SLAR): The AN/APS-94D SLAR employed in the OV-1D Mohawk is greatly improved over the earlier AN/APS-94C used in the OV-1B. The ease of operation, simplified inflight maintenance, and improved inflight read-out have provided MACV commands with a more reliable intelligence-gathering sensor than was available before. The increased range and resolution of this new system have provided a dramatic increase in the accuracy and number of moving targets detected during a typical SLAR mission. The system also processes the imagery in half the time of the older system (42 seconds as compared to 84 seconds) and presents imagery at standard map scales enabling the operator to accurately plot and call inflight reports to the ground commanders much more rapidly than was possible with the earlier model SLAR.

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(3) AN/AAS-24 (IR): The AN/AAS-24 Infrared system in the OV-1D is the replacement for the AN/AAS-14 associated with the OV-1C aircraft. The improvements with the most significance are increased resolution, infrared "hot spot" marker, greatly enlarged cockpit display, and simplified trouble shooting and ground maintenance. The spatial resolution of the AN/AAS-24 enables the mission to be flown at a higher altitude when necessary to provide terrain clearance and an added margin of safety and the "hot spot" marker allow imagery interpretation personnel to read-out and report targets much more rapidly than with earlier model infrared sensors.

e. Infrared Counter Measure System.

(1) With the introduction of SA-7 (Strella) heat seeking missiles into RVN, a method of protection was needed to counter this weapon. Although much R&D work had been conducted on Infrared Counter Measures (IRCM), no IR suppression devices were available in the Army supply system. Additionally, all the R&D work had been conducted against our own missile since the actual characteristics of the SA-7 were not known. USARV requested from DA in mid-May 1972 some IRCM devices for the USARV helicopter fleet. Response was immediate and effective. By late May, an AVSCOM team was enroute to RVN with four prototype IRCM suppression kits. Maintenance representatives from each military region PSU unit were trained by the AVSCOM team in the proper procedures for installation and repair of these kits. The four suppression kits were installed on two UH-1B's, a UH-1H, and an AH-1G.

(2) Detailed analysis in RVN and CONUS of SA-7 missiles captured in MR 1 revealed that the prototype IR suppression kits developed for the UH-1, AH-1G, and OH-6A reduced helicopter heat signatures to the extent that the maximum lock-on range of the missile was less than its minimum engagement range. Production and procurement contracts were released and the first shipment of IRCM kits arrived on 15 June 1972 consisting of sixteen OH-6A kits and four modified OH-6A's accompanied by an eight man installation team. Sufficient kits are programed to be available by late July to modify all RVN OH-6A aircraft. Production and shipment schedules for UH-1 and AH-1G IRCM kits appear to be of a sufficient nature to permit completion of the modification by late August 1972.

(3) USARV has requested IRCM kits for the OH-58 fleet and expects delivery for the first kits in early August 1972. The ALE-29 Flare Dispensing Kit, similar to that used on Air Force F-4 aircraft, has been requested as the IRCM measure for the CH-47 fleet. Delivery by late July 1972 is anticipated.

(4) Additional R&D is required in order to provide IRCM devices for the other types of aircraft in the USARV fleet.

8. (U) Introduction of enemy weapons not used before the present offensive.

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a. T-54 Soviet Medium Tank: The T-54 was used in support of ground troops on assaults in MR 1, 2 and 3. They were engaged and destroyed by US Army aircraft using 2.75" FARS, SS-11 missiles, and TOW missiles. Although the T-54 has engaged Army helicopters with its turret mounted heavy machine guns, this fire has not been effective.

b. PT-76/63 - Soviet Amphibious Tank/Chinese Amphibious Tank: The PT-76 and its new model Chinese counterpart were encountered in MR 1, 2 and 3 in support of ground troops on assaults. They are being effectively destroyed by 2.75" FAR, SS-11 missiles, TOW missiles, and M-72 LAW's. The PT-76/63 have also engaged helicopters with the same results as the T-54. On one occasion a PT-63 engaged a UH-1H SS-11 aircraft with its main gun, turret heavy machine gun, and co-axial guns, all of which proved to be ineffective. The SS-11 destroyed one PT-63 and damaged the other.

c. SA-7 (Strella) Heat Seeking Missile: The SA-7 missiles were encountered almost simultaneously in MR 1 and 3. As of this date, SA-7's have been confirmed in all military regions. Nap-of-the-earth tactics and evasive maneuvers, have effectively countered this missile and the 1st Aviation Brigade elements have continuously conducted offensive operations throughout the NVA offensive.

d. Soviet AT-3 Sagger Wire Guided Missile: The AT-3 was introduced into RVN and has been successfully employed against friendly bunkers and tanks. As of this date none have been employed against aircraft.

e. 12.7mm, 14.5mm, 23mm, and 57mm Anti-Aircraft Guns: Although these weapons are not new to RVN, their use around An Loc, Hue, and Kontum have had an impact on Army Aviation. These weapons were employed similarly to those encountered in Lam Son 719. The nap-of-the-earth tactics have reduced the effectiveness of these systems. Automatic weapons and small arms fire remain the most effective threat encountered throughout the offensive.

9. (U) Use of Aviation Data Analysis Center (AVDAC). Today's management of aviation resources requires accurate, timely, and pertinent information covering a multitude of areas. Of particular benefit has been the data retrieval capability of the Aviation Data Analysis Center. The only organization of its kind in the Army, AVDAC provides the command a central collecting, processing, analyzing, reporting, and storing capability for daily, weekly, and monthly statistics on aircraft readiness, performance, damages and losses. AVDAC has proved its worth as a vital link in the information chain. Its data base contains most of the statistical history of Army aviation operations in Vietnam.

10. (U) First Aviation Brigade Operational Experience and Implications for Future Aircraft Developments.

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a. The NVA forces which invaded RVN on 31 March 1972 were conventionally organized, equipped, and deployed. In most respects these forces with their tanks, armored personnel carriers, artillery and AAA systems constituted a threat comparable to that postulated for mid-intensity conflict in Western Europe. Measures taken to counter the ground and air defense threats have already been discussed; however, the implications of these experiences for development of future aircraft systems merit amplification.

b. The TOW system in both ground and air applications gave U.S. and RVN forces a significant combat advantage. The simple logic involved in target engagement resulted in high first round hit rates and additional gunners were trained in-country with a minimum of expense and effort. Equipping a product improved LOH with TOW type missiles would enormously complicate the air defense problems of enemy tank forces through the introduction of queuing. Each LOH would thus become a potential tank killer. The continued refinement of low level tactics previously discussed, plus the design countermeasures listed below would permit armed helicopters to inflict heavy losses on enemy tank forces. The severest combat damages would be inflicted on spearheading armored forces along the periphery of the lines of contact, and this is precisely the force disposition of greatest concern to NATO planners in Europe.

c. Electronic countermeasures for aircraft self protection historically have consisted of black boxes of varying degrees of complexity which either overwhelmed the threat with raw power or outsmarted the threat by sophisticated electronic routines. Little apparent consideration was given to the acoustic, infrared, and radar signatures of aircraft until recently when the Aircraft Countermeasures Project Manager's Office was chartered in USAAVSCOM to address the self protection of Army aircraft. This is a step in the right direction; however, I propose an additional and even more comprehensive approach. Every Material Need for a new aircraft system should specify the acoustic, infrared, and radar signatures which that system must meet for acceptance. The thrust should cease to be for black boxes to protect aircraft, but rather for aircraft whose flight is all but inaudible in the ambient noise level of their operational environment; whose infrared signatures are so low that they consistently fall below the minimum engagement ranges of hostile heat seeking missiles; and whose radar cross sections are so small that they are all but invisible to enemy early warning and fire control radars. These are attainable goals which can be achieved provided the scientists charged with meeting signature specifications work step by step with aeronautical engineers from the beginning of aircraft design and development. Some trade-offs will result; however, the advantages of this approach to survivability are highly significant. Aircraft would be protected, not by a complex and costly variety of jammers, but by the absence of acoustic and spectral characteristics which the enemy can observe or attack. The precise effects of this approach cannot be stated numerically; however, the recent experiences of the 1st Aviation

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Brigade suggest that enemy armor facing TOW equipped helicopters, which are inaudible except at short ranges, and which they can detect and attack electronically only with great difficulty, would be at a severe combat disadvantage.

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